



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/342,348	06/29/1999	TIMOTHY J. BROSNIHAN	07043/060002	6423

26181 7590 03/28/2002

FISH & RICHARDSON P.C.
3300 DAIN RAUSCHER PLAZA
60 SOUTH SIXTH STREET
MINNEAPOLIS, MN 55402

EXAMINER

MAI, ANH D

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 03/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/342,348

Applicant(s)

BROSNIHAN ET AL.

Examiner

Anh D. Mai

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Amendment

The Amendment filed December 5, 2002 is entered as Paper No. 6. Claims 1-12 are pending. Claims 1 and 2 are amended.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

1. Claims 1, 2 and 5-11 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Bashir et al. (U.S. Patent No. 5,747,353).

Bashir teaches a method of fabricating a microelectromechanical system as claimed including:

providing a substrate (102) having a device layer (106);

etching a first trench (121) in the device layer (106), the first trench surrounding a first region of the substrate;

depositing a dielectric isolation layer (122) in the first trench (121) to electrically isolate the first region from a second region of the substrate (106); and

Art,Unit: 2814

J etching a second trench (120) in the device layer (106), the second trench located in the first region and defining a microstructure (142/144). (See Figs. 1-3).

With respect to claim 2, the method of Bashir further includes forming circuitry in a second region of the substrate outside the first region.

With respect to claim 5, wherein the isolation layer (122) of Bashir fills the first trench (121).

With respect to claim 6, wherein the substrate of Bashir further includes a handle layer (102) and a sacrificial layer (104).

With respect to claim 7, wherein the method of Bashir further includes removing a portion of the sacrificial layer (104) to release the microstructure (142/144).

With respect to claims 8 and 9, wherein the step of etching the first (121) and second (120) trenches of Bashir etches through the device layer (106) to expose the sacrificial layer (104).

With respect to claim 10, wherein the sacrificial layer (104) of Bashir includes silicon dioxide.

With respect to claim 11, wherein the device layer (106) of Bashir includes epitaxial silicon.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

ArtUnit: 2814

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bashir '353.

Bashir teaches deposition of a metal layer, patterning of the metal layer to define the contacts. (See col. 5, ll. 39-50).

Thus, Bashir is shown to teach all the features of the claim with the exception of explicitly disclosing connecting the microstructure to the circuitry.

However, Bashir clearly implies the formation of the metal layer is to connecting the microcircuit to the control circuit in the second region.

3. Claims 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bashir '353 as applied to claim 1 above, and further in view of Hunter et al. (U.S. Patent No. 4,631,803).

Bashir teaches all the features of the claim with the exception of depositing an isolation layer in the first trench (121) prior to filling the trench (122).

However, Hunter teaches depositing an isolation layer (40) in the trench (36) prior to filling the trench with the isolation layer (42).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to deposit the isolation layer (40) in the first trench (121) of Bashir as taught by Hunter to eliminate the formation of defects in the surrounding semiconductor substrate.

With respect to claim 12, the isolation layer (40) of Hunter includes silicon nitride.

Art Unit: 2814

Werner teaches all of the features of the claim with the exception of forming isolation layer (4) includes silicon nitride.

However, Fahey teaches forming isolation layer (60) includes silicon nitride (32). (See Fig. 3).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to form the isolation layer (4) of Werner include silicon nitride (32) as taught by Fahey to relief stress.

With respect to claim 3, the method of further includes depositing an electrical connection over the first trench to connect the microstructure to the circuitry.

With respect to claim 4, the method of Werner further includes depositing a filler material (4) over the isolation layer in the first trench.

Response to Arguments

4. Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

Art Unit: 2814


the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh D. Mai whose telephone number is (703) 305-0575. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A.M
March 22, 2002


OLIK CHAUDHURI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800